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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/731,726	12/08/2000	Kozo Shimizu	001616	1555

7590

11/06/2002

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EXAMINER

IP, SIKYIN

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

Applicant(s)

Examiner

Group Art Unit

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 6/26/02.
- ☒ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-16 is/are pending in the application.
- Of the above claim(s) 7-14 is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-6, 15, 16 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
 - ☐ received in Application No. (Series Code/Serial Number) _____.
 - ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

DETAILED ACTION

Election/Restriction

1. This application contains claims 7-14 are drawn to an invention nonelected without traverse in Paper No. 6. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 103

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-6 are rejected under 35 U.S.C. § 103 as being unpatentable over PL

115725, JP 2000015476, Arai et al, or USP 6160224 to Ogashiwa et al in view of JP 409260427.

5. The PL 115725, JP 2000015476, Arai et al, or Ogashiwa et al reference(s) disclose(s) the features including the claimed semiconductor structure and Sn-Ag solder bump. The features relied upon described above can be found in the reference(s) at their abstracts. The difference between the reference(s) and the claims are as follows: PL 115725, JP 2000015476, Arai et al, and Ogashiwa et al do not disclose the alpha ray in Sn. However, JP 409260427 in abstract and Table 1 in col. 7 disclose(s) alpha ray could be reduced from a solder bump in the same field of endeavor or the analogous metallurgical art. Therefore, it would have been obvious to one having ordinary skill in the art of the cited references at the time the invention was made to reduce alpha rays from a solder bump as taught by JP 409260427 in order to eliminate soft error inversion ratio of semiconductor device. In re Venner, 120 USPQ 193 (CCPA 1958), In re LaVerne, et al., 108 USPQ 335, and In re Aller, et al., 105 USPQ 233.

6. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over references as applied to claims 1-6 above, and further in view of USP 4690725 to Bult et al.

7. The claimed subject matter as is disclosed and rejected above by the cited

reference(s) except for preparing Sn alloy by a zone-melt method. However, Bult in col. 1, line 65 to col. 2, line 6 teaches zone refining/melting of Sn in the same field of endeavor or the analogous metallurgical art to purify Sn. Therefore, it would have been obvious to one having ordinary skill in the art of the cited references at the time the invention was made to purify Sn with zone refining as taught by Bult in order to improve Sn purity. In re Venner, 120 USPQ 193 (CCPA 1958), In re LaVerne, et al., 108 USPQ 335, and In re Aller, et al., 105 USPQ 233.

Response to Arguments

8. Applicant's arguments filed June 26, 2002 have been fully considered but they are not persuasive.

9. Applicants are correct that JP 2000118 should be read as JP 200015476.

10. Applicants argue that none of Koslowski, Matsumoto, and Arai discloses the claimed narrow Sn alloy composition. As is pointed out by applicants in the page 3, first full paragraph of instant remarks, that the instant claimed Sn alloy composition is overlapped by Sn alloy compositions of said references. Overlapping ranges have been held to be a prima facie case of obviousness. As stated in In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), "the disclosure in the prior art of any value within a claimed range is an anticipation of that range."

11. Applicants' argument with respect to Ogashiwa as set forth in page 3 of the instant remarks is noted. But, the instant solder alloy has open transitional expression "having" which does not exclude any unrecited elements even in major amounts. Furthermore, examples of the cited reference are given by way of illustration and not by way of limitation. In re Boe, 148 USPQ 507 (CCPA 1966) and In re Snow, 176 USPQ 328.

12. Applicants' argument in paragraph bridging pages 3 and 4 of the instant remarks is noted. But, atomic number of Ag is 47 which is smaller than 81. The JP 409260427 teaches to select the elements have atomic numbers smaller than 81 and not related with alpha decay in order to reduce alpha rays emitted from a solder bump. Although said reference does not disclose the alpha ray concentration, the goal is same as instant invention to reduce it to zero in order to reduce the soft error inversion ratio of a semiconductor device. It is well settled that the difference in degree of purity itself (here alpha ray concentration) does not predicate invention. In re Merz, 38 USPQ 143 and In re King et al, 43 USPQ 400.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See MPEP § 2163.06 (a) and 37 C.F.R. § 1.119.


Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Ip whose telephone number is (703) 308-2542. The examiner can normally be reached on Monday to Friday from 5:30 A.M. to 2:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King, can be reached on (703)-308-1146.

The facsimile phone numbers are (703) 872-9310 (non-final Official Paper only), (703) 872-9311 (after-final Official Paper only), and (703) 305-7719 (Unofficial Paper only). When filing a FAX in Technology Center 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are not for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0651.



SIKYIN IP
PRIMARY EXAMINER
ART UNIT 1742

S. Ip
November 4, 2002